


1994

# The Ohlone and the oak woodlands: Cultural adaptation in the Santa Clara Valley

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*Santa Clara University*

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# Research Manuscript Series

**THE OHLONE AND THE OAK WOODLANDS:  
Cultural Adaptation in the Santa Clara Valley**

**Grant William Schick**

Research Manuscript Series, No. 4

1994

on the Cultural  
and Natural  
History of  
Santa Clara



**Santa Clara University**



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Cultural Adaptation in the Santa Clara Valley**

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## FOREWORD

Today a mixed cultural and natural landscape characterizes the south San Francisco Bay Area. This is the legacy of over two hundred years of contact between indigenous and foreign peoples, plants, and animals. As each of the different peoples who inhabited this space interacted with the environment, they altered the landscape, reshaping it according to the values of their culture. The choices made by the earliest inhabitants led over time to subtle changes, while more recent settlers have caused more dramatic change. In either case, however, we must realize that the Santa Clara Valley has been undergoing human induced change for thousands of years. The **Research Manuscript Series on the Cultural and Natural History of Santa Clara** is intended to contribute to the unraveling of this long-term process.

Santa Clara University faces its sesquicentennial and the millennium with an eye toward educating a new generation sensitive to issues surrounding the transformation of our social and natural world. This education is predicated on the critical assessment of other points of view and lifeways. Undoubtedly, an appreciation of the creation of our complex environment and our multicultural world will enable us to better care for our globe.

The **Series** was born through the interaction of faculty and students in Anthropology/Sociology, Biology and History who sought to understand how and why humans have altered the landscape in the South Bay Area. It was believed that this crossing of disciplinary lines would benefit students and, in turn, the campus and larger community through the dissemination of their work. With this in mind, the title of the **Series** was left specifically general to encourage a broader consideration of our cultural and natural landscape.

We in the Department of Anthropology and Sociology are especially proud to begin the **Series** with the revised theses of four of our graduating seniors. Their hard work makes a contribution that will continue to benefit Santa Clara University through docent and public education for years to come. Special recognition must go to Dr. Russell Skowronek, the advisor for these four theses, both for his work with these students, the creation of this **Series**, and his tireless efforts to uncover the rich history of Santa Clara.

In conclusion, we would like to acknowledge and thank for their support of this series the following individuals: Academic Vice President Steve Privett; Associate Academic Vice President Don Dodson; Assistant to the President, George Giacomini; Peter Facione, Dean, College of Arts & Letters; Julia O'Keefe, University Archivist; Rebecca Schapp, Director, de Saisset Gallery & Museum; Bob Senkewicz, Chair, Department of History; Janice Edgerly-Rooks, Biology; John McCormick, Physical Plant; and Lorie Garcia, Planning Commissioner for the City of Santa Clara.

George Westermarck, Chair  
Associate Professor, Anthropology



## PREFACE

When I joined the Department of Anthropology and Sociology at Santa Clara University in 1991, I was charged with the responsibility of improving the interpretation of SCU's mission and pre-contact era past through museum enhancement and the development of a walking tour of the historic components of the campus. With these, and other related personal research goals in mind, I began my background research and came to be involved with the Santa Clara County task force for the Juan Bautista de Anza National Historic Trail. As historical coordinator for this task force I sought to identify tangible evidence of Santa Clara County's cultural and natural past.

In 1993 I met with Janice Edgerly-Rooks (Biology) to obtain information on plant and animal habitats in pre-contact Santa Clara County. At that time I learned of her proposal for on-campus environmental study areas and of Kerry Wilson's (Santa Clara Community Action Program) plan for a community fruit and vegetable garden. Together we joined forces and developed a proposal entitled, "**Transformation of the Santa Clara University Landscape.**" In this document we discussed how SCU's cultural and natural landscapes could be integrated with a community garden, thus creating an opportunity for learning beyond the classroom setting. With the support of the University the first phase of this outdoor classroom came in the development of a "natural area" as a part of the 1994 Alameda Redevelopment Project.

At Santa Clara University there is a tradition of faculty working closely with students. The Department of Anthropology and Sociology requires a Senior Thesis for each of its graduates. During the 1993-94 academic year four seniors, Joanna Blume, Virginia Czosek, Erin Reilly, and Grant Schick, elected to work with me on projects related to the cultural and natural history of the Santa Clara area. These theses, focusing on local cultural ecology, served as the catalyst for the **Research Manuscript Series on the Cultural and Natural History of Santa Clara**. For twenty weeks during the Winter and Spring quarters of 1994, the students worked as a team on their respective areas of research. At weekly meetings their discoveries, and problems, were shared and discussed. Each of the theses was read and commented upon by at least two Anthropology faculty members and by each of the students. The goal of this process was clarity and consistency beyond that of the normal student project. Although for the **Series** I have made some editorial changes and additions, the former students should be very proud of their accomplishment.

In closing, I would like to extend recognition to a number of individuals not already mentioned in the Foreword for their direct and indirect influence on these papers. They include: Sandy Chiaramonte, Administrative Assistant, Department of Anthropology and Sociology, SCU; Mark Hylkema, Caltrans archaeologist; Ohlone and Esselen descendants Rosemary Cambra, Loretta Escobar-Wyer and Andrew Galvan; the San Jose Historical Museum Advisory Board for the Peralta Adobe; and Joe Adamo, Steve Haze, Doni Hubbard, Meredith Kaplan, Joan Throgmorton, and Phil Valdez members of the Task Force for the Juan Bautista de Anza National Historic Trail.

Russell K. Skowronek, Ph.D.  
Assistant Professor of Anthropology

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in the

Research Manuscript Series

on the

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Schick, Grant William

1994 The Ohlone and the Oak Woodlands: Cultural Adaptations in the Santa Clara Valley. Research Manuscript Series on the Cultural and Natural History of Santa Clara, No. 4, Santa Clara University, Santa Clara, CA.

June 1994



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## ACKNOWLEDGEMENTS

The author would like to express his great appreciation to many people whose kindness and advice made this research possible. First the writer wishes to thank Dr. Russell Skowronek, Assistant Professor of Anthropology, Santa Clara University, for his invaluable advice, encouragement and wisdom throughout the project; Christopher Kayser for his advice, support and editing assistance; Dr. George Westermarck, Associate Professor of Anthropology and Chair of the Department of Anthropology and Sociology, Santa Clara University, for providing useful source material and assistance with editing; Julia O'Keefe, Santa Clara University Archivist for access to invaluable primary documents; Anna Koster, Collections Manager and Public Relations Officer de Saisset Museum, Santa Clara University; Joanne Blume, Virginia Czosek, and Erin Reilly, for their support and direction; the Santa Clara University Anthropology staff; my fellow Anthropology students; and my close friends, whose support has made the completion of this research possible.

## **A Poem of Life and Fertility**

The Acorns come down from heaven.  
I plant the short acorns in the Valley.  
I plant the long acorns in the Valley.  
I sprout: I, the black acorn, sprout: I sprout.

(Pavlik et al. 1991:102)



# CHAPTER 1

## INTRODUCTION

### **PROBLEM**

Today, Santa Clara Valley consists of a modern industrialized environment distinguished by concrete, pavement and automobiles. These "innovations" made by modern technology began only recently. The environment and ecology of 200 years ago was extremely different from ours today. Filled with many native habitats, it thrived through the inter-dependance of all plant and animal species. In this study, I examine the characteristics of Santa Clara Valley in centuries past and today, in order to understand the vast number of resources which were available to the native inhabitants of the Santa Clara Basin. This paper has its base in cultural ecology, the study of the way in which the culture of a human group has responded and adapted to the natural resources of the environment as well as to the existence of other human groups. Therefore, although I take a strong biological approach to ecology, I will also attempt to see how human society and culture in the Santa Clara Valley developed in response to the environment.

Two centuries ago, when the Santa Clara Valley was first described by Westerners, nearly 60% of the basin was covered by Oak Woodlands (Pavlik, et al. 1991:13). Although many other ecological zones within this area were utilized for subsistence, one in particular, the Oak Woodland, has been identified as being of significance to the aboriginal inhabitants of the valley. Through a long and unique process, which began when native peoples first arrived in the Santa Clara Valley Basin nearly 3500 years ago (Heizer 1971:140), indigenous peoples adapted to a lifestyle which depended heavily upon the resources of the Oak Woodland for food and shelter. To illuminate this relationship, this study will look at the inter-dependance that can be found within the Oak Woodlands, between the environment, and the technology, social organization and ideology of the Native Americans. In particular, the cultural modifications made to important environmental factors that allowed natives to fully utilize the Oak Woodlands of Santa Clara Valley as a means of subsistence will be explored.

Recognizing the diversity of the environment, we must also consider the contributions of other ecological communities which were not as readily used as the Oak Woodland. For instance, were the large grassland and chaparral zones of the Santa Clara Basin used by natives for food or other resources, in addition to the Oak Woodland? If so, then how were they used? And how were the uses of these

particular areas tied to the changes in lifestyle and culture made by natives? In order to answer these and other questions we must, as the natives did before us, have a complete and balanced understanding of the different ecological communities as well as the resources available within these communities (see Blume 1994, Czosek 1994, Reilly 1994; this series).<sup>1\*</sup> This will be done by looking at the major ecological zones individually. We also will focus on the direct or indirect affects that these different environmental zones could have had upon such features of indigenous life as political and inter-community relations.

The perspective of this paper will not be limited to environmental determinism, which limits the form and structure of a culture to a few environmental factors; or to a reductionistic perspective, which would assert that there are no regularities in culture and that culture is not an adaptive system. The perspective this paper will take deals with the human ecology of Santa Clara Valley and the fundamental questions associated with the adaptation to the surrounding environment for food resources and the capability to use those resources.

## METHODOLOGY

The methodology used in preparing this study consisted of documentary research and a scholarly literature review. The literature review incorporated primary sources, such as archeological reports, journals from early explorers and documentary missionary reports. Secondary sources, such as ethnographic studies were used both to confirm and to complement the findings of the primary documents.

The primary and secondary sources used consisted of two basic types of reports, archeological/ethno-historic and biological/natural history. Both of these types of sources reflect the biases of their respective disciplines. In examining the different ecological communities of the Santa Clara Valley, both archeological and ethnographically documented examples will be used to illustrate that the examination of human culture from an ecological perspective can produce useful results. Within the archeological and ethno-historic documents, we find less attention to the natural environment, whereas within the Biology and Natural History documents we find less attention for human culture and their interaction with the environment, although, they do present good information on the specific ecosystems that encompass all plants, animals and the surrounding physiography. Together, however, these two types of documents, archeological/ethno-historical and biological/natural history, present a holistic view of the past that diminishes potential biases.

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<sup>1\*</sup> Editor's Note--For information on the campus landscaping project to which this manuscript is linked, see Preface.



## CHAPTER 2

### NATURAL HISTORY

#### CLIMATE

Over the last 4000 years, the subtropical climate of the San Francisco Bay area has remained about the same (Breschini, et al. 1983:20). Because of the surrounding relief and its proximity to the Pacific Ocean, the area is mild most of the year (Breschini, et al. 1983:18). The Santa Clara Valley is characterized by wet and dry periods that coincide with the winter and summer seasons (Bean and Rawls 1983:1). The Santa Clara Valley averages approximately 13-14" of rain per anum (Lindsey 1974:86; Breschini, et al.1983:18; Beals and Hester 1974:39-40), with unusually wet years receiving nearly 26" per anum, while drought years can see as little as 6" per anum (Lindsey 1974:86). Although there is a general increase of precipitation as you move from the ocean inland toward the Santa Cruz Mountains, there is a decrease from the mountains to the valley. Rainfall increases again as you move toward the eastern Diablo Range. Summers in the Santa Clara Valley are generally hot and dry, while the winter and spring months are cool and wet. Temperatures for this area have been recorded as low as 10° Fahrenheit in the winter and over 100° Fahrenheit in the summer, with temperature averaging approximately 60° Fahrenheit (Lindsey 1974:85; Breschini, et al. 1983:18).

#### GEOLOGY

Although the geology of Santa Clara Valley is diverse and extensive knowledge of oak tree soil preferences is minimal, we do understand that the oak tree has gained the ability to adapt to growing in several types of soils and at significantly different elevations. Generally speaking, Santa Clara Valley consists of deep alluvial flood plain soils at elevations lower than 2,000 feet (Beals and Hester 1974:43). When looking at the five species of oak found in the Santa Clara Valley, we see a general preference in soil type and growing elevation, but these preferences are not always absolute. For instance, the Valley Oak tends to favor a deep rich bottomland or valley floor soil at elevations less than 2,000 feet (Pavlik, et al. 1991:10). Similarly, the Coast Live Oak prefers soils which are well drained, like those of the coastal plains and inland bluffs, growing at elevations up to 5,000 feet (Pavlik, et al. 1991:26). Found in the hot interior valleys, the Blue Oak does not seem to require

excessive rainfall or well developed soils (Pavlik, et al. 1991:18). Similar to the Blue Oak, the Black Oak is also found at higher elevations. The Black Oak can survive in elevations reaching up to 6,000 feet and seems to have no strict soil requirement, but prefers the well drained soils that typify those of mountain slopes, cliffs and ridges (Pavlik, et al. 1991:14). Like both the Blue and Black Oak, the Interior Live Oak can grow at elevations of up to 5,000 feet in the low foothills and along valley bottoms. Although the Interior Live Oak has no apparent soil preference, it is known to dominate the banks of rivers and streams in lowland valleys (Pavlik, et al. 1991:20).

## **PHYSIOGRAPHY**

Many of the physiographic features of the Santa Clara Valley are consistent with those required for the growth of the Oak Woodland, Grassland and Chaparral communities. The different oak trees, grasses and chaparral all require different growing elevations which directly correspond to the surrounding physiography. When looking more specifically at the oak species in the Santa Clara area, we find that these are the species which prefer elevations such as those of the Santa Clara Valley floor as well as the foothills and lower mountain ranges.

The Santa Clara Valley study area lies in the Northwest part of Santa Clara County, in the west central part of California. Santa Clara Valley, which lies in the San Francisco Bay drainage basin, reaches variable widths and extends approximately 60 miles in a southeasterly direction from the southern end of San Francisco Bay (Beals and Hester 1974:24-25). One of the largest valley's in the Coast Range, Santa Clara Valley is separated from the Pacific Ocean by the Santa Cruz Mountains. On the east side of the Valley, the border is formed by the Diablo Range, one of the largest and most extensive of all coastal ranges.

The western border of Santa Clara Valley, the Santa Cruz Mountains, consists of several ridges and smaller ranges that have rugged terrain and steep slopes. The Santa Cruz Mountain range has an average height that ranges from 2000 to 3000 feet. Loma Prieta and Black Mountain are the two highest mountains measuring 3,806 ft and 2,787 respectively (Lindsey 1974:85; Breschini, et al. 1983:13-14).

The eastern upland area of Santa Clara Valley consists of several hills and mountains. Many of the lower foothills of the Diablo Range are smoother and have flatter slopes than those of the western border. The crests of the foothills reach a maximum of 2,000 feet but generally average around 1,000 feet (Lindsey 1974:85; Breschini, Haversat, Hampson 1983:14). To the east of the foothills, the Diablo range rises to a maximum height of 4,372 feet at Copernicus Peak, with the second highest peak, Mt. Hamilton, measuring 4,209 feet (Lindsey 1974:85; Breschini, et al.



1983:13). Mount Diablo itself supported a variety of Grassland, Chaparral and Oak Woodland communities (Mayfield 1983:33).

The lowlands, or valley floor, consists of flood plains formed by the deposits of several different streams and rivers that enter the valley from both the Santa Cruz Mountains and the Diablo Mountain Range. The width of the valley floor running west to east directly through San Jose is approximately 14 miles. Elevations of the valley floor reach nearly 300 feet at the foothills and drop to sea level at the southern tip of San Francisco Bay (Lindsey 1974:85; Breschini, et al. 1983:13). More than half of the Santa Clara Valley comprises the flood plains, over one quarter is upland, and the remaining area consists of wetlands.

The Santa Clara Valley is drained by two distinct stream systems. The first and primary drainage enters the Santa Clara Valley from the eastern Diablo Mountain Range. This particular drainage system is comprised of several streams: the Scott, Calero, Arroyo de los Coches, Berryessa, Penitencia, Silver and Coyote. The largest, Coyote Creek, drains most of the southeastern part of the county, while the other streams primarily drain the eastern side of the valley. From north to south, there are several principle streams that originate in the western Santa Cruz Mountains and drain into the San Francisco Bay. The San Francisquito, Madera, San Antonio, Permenente, Stevens, Calabazas, Campbell, San Tomas Aquinas, Los Gatos, Guadalupe and Los Alamitos Creek make up the primary drainage streams that run through the central valley (see Reilly 1994; this series).

## VEGETATION

In order to gain a clear understanding of the Oak Woodland community itself, we must first look at and understand the surrounding environmental communities and how they had both a direct and indirect influence on the Oak Woodland. Vegetation communities such as the Grassland and the Chaparral not only provided support and resources for the Oak Woodlands, but also supplied food and non-food resources which aided in native use of the vast oak tree resources.

The Santa Clara Valley is home to a wide range of vegetation types. In winter and spring, grasses predominate, while in the late spring, summer and fall, trees, shrubs and wildflowers go into full bloom (see Blume 1994; this series). Most of the valley floor that used to be home to grass species, such as bunch grass, was cleared for agricultural and grazing purposes (Lindsey 1974:1). The original clearing of grasslands and chaparral had a tremendous impact upon the Oak Woodland, as we will see later. Although many of these areas are permanently gone, a few native grasses, like the bunch grass, have managed to return.



In general, the terms "plant community" or "vegetation community" refers to the presence of a certain dominant species of flora (Munz 1968:10). Within California, plant communities are composed of one or more specific vegetation types. For example, the Oak Woodland community is primarily dominated by various species of the genus *Quercus*, or oak, but is strongly linked with the grassland and chaparral communities. Within the Oak Woodlands of Santa Clara Valley, grasses provide a rich undergrowth which prevents erosion and retains moisture within the soil, as well providing fodder for grazing animals such as antelope, deer, and elk.

These floral communities are recognized by distinct characteristics which include: vegetation type, climate of the area, fauna residing in the area, physiography, geology and soil type (Munz 1968:10). The major vegetation communities found within the San Francisco Bay Area were the grasslands, woodlands, evergreen forests, marshlands or wetlands, and chaparral communities (Munz 1968:11). As noted earlier, the survival of these inter-dependent communities relied upon characteristics of the area. For example, a north-facing slope may differ from a south facing slope in several ways: the north side may receive more sun but less rain, while the south side receives more rain and less sun. In this particular example, the northern slope has characteristics which satisfy the criteria of an oak forest, and will therefore be more likely to develop this type of floral community. While the southern slope with its abundance of rain and little sun might be better adapted to foster a Redwood Forest habitat. In this example, it is easy to see how climate can allow particular floral communities to flourish and in turn attract different faunal communities as well (Munz 1968:12).

In the Santa Clara Valley, we can readily find all of the above mentioned floral communities, but as we will see, the most dominant and important of these communities to natives was the Oak Woodland community. In the next few sections, we will explore the different floral communities of Santa Clara Valley and surrounding areas to gain more comprehensive understanding of the environment and ecology of the study area.

## **GRASSLANDS**

At first glance, the grasslands surrounding the Oak Woodland community would seem quite insignificant and useless, yet with closer examination we see that grassland communities aided the natives in many ways. First and foremost the grasslands surrounding a typical Oak Woodland could be used for basket making. Grasslands "...are known to have been exploited prehistorically by the Costanoans [Ohlones], including those resources used industrially for baskets, tule boats and mats, etc. Costanoan [Ohlone] basketry materials included willow, rush, tule and the roots of 'cut grass'." (Bergthold, et al. 1980:6). The use of the basket was extremely important in the harvesting of acorns. When acorns were harvested by the native

peoples of the Santa Clara Valley, they had to be transported with the aid of baskets. In addition, the grasslands of the valley supplied additional resources for grazing animals such as deer and elk, while at the same time representing a potential growth area for the expansion of the Oak Woodland itself (Pavlik, et al. 1991:95).

The coastal grasslands or prairies typical of the study area vary from other grasslands because of their adaptation to a cooler environment (Mayfield 1978:40). Located mostly along the western slopes of the middle Coast Ranges, the coastal prairies are inhabited by bunch grasses and various types of flowering herbs which have adapted to fog, cooler temperatures and high rainfall.

The valley grasslands constitute the second major grassland community. The valley grasslands range from the low, hot valleys of the inner Coast Ranges to the foothills of the eastern Diablo Range. Typically, valley grasslands form the rich undergrowth of the oak savanna and oak woodland communities such as in the Livermore and Santa Clara Valley areas (Mayfield 1978:39).

The grasslands that presently grow in the study area do not accurately reflect the native grasses or the conditions which were associated with pre-contact environment. Today the introduction of weeds, cattle grazing, industrial and commercial development and cultivation have all but destroyed many of these natural habitats (see Blume 1994, Czosek 1994, Reilly 1994; this series).

## **CHAPARRAL**

To fully understand the impact that this vegetation community had upon its inhabitants and vice versa, we first must understand the specific characteristics and traits of the Chaparral community in relation to the Oak Woodland community. Typically, chaparral communities are inter-connected with Oak Woodland communities. Similar to grasses, chaparral also acts as an undergrowth for oaks trees. In addition, chaparral is home to many animals in the Oak community such as snakes, rabbits and other small rodents. Of significant importance to natives was the flammability of shrubbery and chaparral due to its lack of moisture (Pavlik, et al. 1991:57). Through controlled burning, natives could control the growth of chaparral in and out of the Oak Woodland, thus effectively controlling the population of deer and other animals who feed upon the chaparral and grasses of the Oak Woodland (Mayfield 1978:78,98). Controlled burning would also allow natives to eliminate ground cover which, as we shall see, was a problem for oak saplings (Mayfield 1978:47; Pavlik, et al. 1991:56).

The brush and chaparral communities of the Santa Clara Valley consisted of shrubs that were hard and woody (Mayfield 1978:98). Unlike the grasses associated with the Santa Clara Valley, there are only a few chaparral species that dominate this



community. Some of the more dominant chaparral species in the study area include the California scrub oak, *Quercus dumosa*; scrub canyon live oak, *Quercus chrysolepis*; Jimbrush, *Ceanothus sorediatus*; birchleaf mountain mahogany or hardtack, *Cercocarpus betuloides*; poison-oak, *Toxicodendron diversilobum*; and the chaparral-pea, *Pickeringia montana*. In general, chaparral growth is dense and can vary from 4 to 10 feet in height and can occupy soils that are not favorable for the growth of timber or woodland floral communities (Pavlik, et al. 1991:38). Chaparral is also very adapted to both wet and dry areas of California, thus making it a well adapted floral community that can easily survive the diverse environment of the Santa Clara Valley area. Although chaparral communities provide an effective ground cover and resources, their importance to natives lies primarily in their inter-dependant role with the Oak Woodland.

## OAK WOODLANDS

The Oak Woodland was very important to the natives of Santa Clara Valley. Not only did the Oak Woodland provide extensive faunal resources, but more importantly it contained the main dietary staple used by native peoples, the acorn (Margolin 1978:41; Kroeber 1925:96). With its abundance of oak tree species as well as its massive oak groves, the Oak Woodland supplied indigenous peoples with an immeasurable amount of food and non-food resources. To fully understand the impact that this vegetation community had upon its inhabitants and vice versa, we first must understand the specific characteristics and traits of the oak trees which inhabited the Oak Woodland community.

There are several different oak tree species which make up oak communities in California. In the Santa Clara Valley and the San Francisco Bay Area, there are five oak species that dominated the oak groves of yesterday. The Valley Oak, Coast Live Oak and the Black Oak constituted the majority of oak species in the area that were used by the natives of Santa Clara Valley (Munz 1968:16-17; Mayfield 1978:42). The two remaining species of oaks, the Blue Oak and Interior Live Oak, were not as prevalent due to climate and other growing conditions, as well as competition from oak species that had excellent growing conditions (Mayfield 1978:42).

The most massive of all oak species is the Valley Oak, *Quercus lobata* (Mayfield 1978:44; Pavlik, et al. 1991:10). The Valley Oak is quite unique to California because of its wide distribution throughout the state (Pavlik, et al. 1991:12). The greatest and most impressive of all oak tree species, the Valley Oak flourishes in the shallow water tables of the foothills and valley's among the Coast Ranges. Although the Valley Oak is a winter-deciduous tree, mild climates allow its immense canopy to reach nearly 100 feet in the air and live for up to 600 years (Pavlik, et al. 1991:10-11). During California's first geological survey in 1861, William Brewer recorded this passage just north of Monterey:



...I measured one [valley oak] with wide spreading and cragged branches, that was 26.5 feet in circumference. Another had a diameter of over six feet, and the branches spread over 75 feet each way. I lay beneath its shade a little while before going on.  
(Pavlik, et al. 1991:11)

This example is only one instance in which the first explorers of San Francisco and Monterey Bay areas recognized the beauty of the great valley oak.

The Valley Oak produces the largest acorn of all oak species in California, and for this reason was often the most harvested of all oak species, second only to the Black Oak's sweet tasting acorn (Mayfield 1978:44). The acorns of the Valley Oak vary in size and shape and can measure anywhere from one to two inches in length, but can often contain large amounts of tannins which make it less palatable and therefore not as desirable (Pavlik, et al. 1991:12).

The Coast Live Oak, *Quercus agrifolia*, is a low growing evergreen tree (Pavlik, et al. 1991:26). The Coast Live Oak is characteristically found in all California coastal plains, valleys and foothills. Unique to the oak species, the Coast Live Oak has adapted the ability to grow along the coast, tolerant of cool weather, fog and salt air (Pavlik, et al. 1991:26). Due to this adaptation, the Coast Live Oak flourishes on the San Francisco peninsula and around the Santa Clara Valley area. The Coast Live Oak can exceed 250 years of age with trunks measuring from 8 to 12 feet in circumference (Pavlik, et al. 1991:26). The Coast Live Oak produces an acorn that is conical in shape and averages 1/2" in length and are considered palatable if leached properly (Pavlik, et al. 1991:26).

Unlike most oak species the Black Oak, *Quercus kelloggii*, does not dominate its habitat (Pavlik, et al. 1991:13). Commonly found in the upland mountain areas, the Black Oak is scattered along the South Coast, Coast and Peninsular Ranges. The Black Oak has acquired the ability to survive hot dry summers and typically freezing snowy winters. This adaptation has allowed the Black Oak to survive within Valley and Coast Live Oak dominated communities. When mature, the Black Oak can reach a height of 70-80 feet and can reach an age of 450 years (Pavlik, et al. 1991:14). The oblong acorns produced by the Black Oak can reach 1 to 1 1/2" in length (Pavlik, et al. 1991:15).

## OAK WOODLAND ECOLOGY

The territory that native peoples inhabited in the Santa Clara Valley included a wide variety of plant and animal communities. The native peoples of the Santa Clara Valley had access to and utilized the massive redwood forests and an abundance and

variety of wildlife. To the south, Monterey offered rich cypress stands as well as abundant and dependable marine resources. Although indigenous peoples utilized all plant communities, it was the inter-dependance of different communities (Chaparral and Grassland) with the Oak Woodland that was of greatest importance because of its abundant resources. Natives must have had a deep understanding of the inter-dependance, or ecology, of these communities in order to fully utilize their resources.

Within the Oak Woodland community of Santa Clara Valley, there were several traits that the native peoples recognized as essential for the survival of not only themselves, but for the ecosystem that they depended upon for survival. Native understanding is exemplified by both past and present sources which describe the delicate balance sustained between themselves and faunal and floral communities that shared the Oak Woodland for food, shelter and survival.

The Oak Woodlands of the Santa Clara Valley sustained many animal species that were adapted to survive in specific plant communities where they were able to obtain food, water, shelter and nesting sites (Mayfield, et al. 1978:57). Oak trees produced a variety of foods which included acorns (the oak tree fruit), leaves, twigs, branches, roots, sap and pollen (Pavlik, et al. 1991:75). Animals both large and small, help to carry acorns far off from the harvesting site. For instance, squirrels and birds are known to carry acorns off to small caches, or underground storage areas, sometimes far away from the original parent tree. By "planting" acorns, these animals are aiding not only in the survival of the oak tree, but also expanding the geographic range of the oak tree and Woodland community (Pavlik, et al. 1991:78). Other such foods include grasses and scrubs (undergrowth), fungi, lichens, algae and mistletoe (Pavlik, et al. 1991:75). These foods were eaten by different animals, such as insects and birds, that carried off acorns to new locations where they might flourish. In this way, the Oak tree was helped in its reproduction process by the very animals who consumed it.

The most widely recognized food resource produced by the oak woodland community is the acorn (Pavlik, et al. 1991:76). The acorn, rich in carbohydrates and fats, is a high energy food which often times sustains many inhabitants of the Oak Woodland year round. The acorn provides a steady dietary staple for a wide range of animals such as insects, birds and mammals (Pavlik, et al. 1991:76). Typically, acorn crops are harvested by all animals in the late summer period and early fall. This is quite essential for the survival of many animals in winter as acorns provide a much needed source of both carbohydrates and fats. During harvesting season, many animals such as the black bears, wild pigs, birds, squirrels, woodpeckers and rats eat or store acorns for later use (Pavlik, et al. 1991:76). The total mast crop - crop that includes all berries, nuts, and acorns of the entire oak community - is so important that studies have linked it to the reproductive success of deer and other mammals in the following year (Pavlik, et al. 1991:76). For a nutritional and comparative breakdown of acorns see Appendix A.



devised several different processing techniques in order to prepare the acorns for eating; these could take anywhere from three days to several weeks to complete (Basgall 1987:26-27).

The easiest technique for processing acorns took at least several weeks (Basgall 1987:26). The first step in this process was to dig a whole next to a stream or river and line it with leaves. The acorns would then be placed into the hole and covered with mud, and left for several weeks during which time the tannins would be pulled or leached, producing a sweet acorn (Basgall 1987:26). But, this process had several drawbacks to it. First and most notable, this process did not always remove all the tannins in the acorn, thus making it less palatable. Secondly, remaining in the ground for so long, acorns were exposed to excessive moisture and were thus prone to rotting and spoiling. In addition, the length of time needed for this process was inefficient and could never be expected to support a large population over a long period.

The most common technique used by the Ohlone and other Native Californians was more complex but yielded better results. This three day process of leaching involved several steps (Basgall 1987:28). All of the steps involved in acorn processing, from leaching to cooking, were completed by women (Margolin 1978:43). The first step of the leaching process was to shell and ground the acorn. Once shelled, the nut of the acorn was then ground using mortars and pestles or stone grinding tools. Performed daily, this phase of acorn processing allowed Ohlone women to gather together to grind and prepare the acorn meal (Levy 1978:493). Placing the mortar between their legs, they would drop the pestle on the nuts grinding them to a fine powder, while singing songs and talking amongst each other (Margolin 1978:43). From the daily need to prepare acorns, women were able to develop an environment in which they had time to talk amongst themselves and gossip about their people. It was estimated by Basgall that it would take no more than 180 minutes to grind 2.7 kg, or approximately 1.2 pounds of dry acorns (Basgall 1987:28). Once ground into a fine powder, the leaching process would begin.

The acorn powder was first placed in either a leaf lined hole or a basket, after which hot water was strained over it (Margolin 1978:44; Pavlik, et al. 1991:100). Water was boiled by placing fire heated rocks into a basket of water. The rocks were constantly turned in order to both heat the water and prevent the rocks from burning a whole in the basket. The entire leaching process required very little attention except for the heating of water and the straining of the water over the meal. The same 2.7 kg of ground acorn powder would produce 2.4 kg of leached acorn meal in about 237 minutes (Basgall 1987:28).

The final step was the cooking of the leached acorn meal. Leached acorn powder was added to water and heated with hot rocks in a basket, the entire cooking process taking approximately 30 minutes (Basgall 1987:28). This would produce



## CHAPTER 3

### THE OHLONE PEOPLE

#### SYNONYMY

In the past, California native tribal names were determined primarily by the Spanish explorers who conquered them. In both the archeological as well as anthropological record, the natives of the Santa Clara Valley were commonly referred to as Costanoans, an anglicized Spanish term. The name Costanoan is widely used in historical anthropological documents to describe the peoples who lived between the San Francisco Bay and Monterey Bay areas. Costanoan, originally comes from the Spanish word *Costeños*, which means "coast people" (Breschini, et al. 1983:283; Kroeber 1925:462; Levy 1978:494). This term was later anglicized to *Costaños*, and finally into Costanoan. Due to the anglicization process, nearly all of the politically independent groups in the Costanoan territory became homogenized under the name Costanoan (Breschini, et al. 1983:283; Kroeber 1925:462; Levy 1978:494). Two names were then applied to differentiate the Costanoan languages, Olhonian and Mutsun. The name Olhonian was derived from the name of a tribelet, ?olxon, located on Gregorio Creek in San Mateo county (Levy 1978:494). In 1826, Beeckey's account of his San Francisco Bay trip is the first reference to the "Olchone"; who according to Beeckey, referred to natives who inhabited the coast between San Francisco and Monterey (Levy 1978:494). The Olchone, over time, then became known as the Ohlone. Today, Ohlone is the most popular term used by the survivors of indigenous peoples to describe not only themselves but their ancestors as well. Although much of the historic record does refer to these peoples as Costanoans, ancestors today prefer to recognize themselves as Ohlones. Because it is important that we recognize this and respect the wishes of the native descendants, we use the term Ohlone throughout the Series.

#### PREHISTORIC SETTLEMENT AND SPANISH CONTACT

The best evidence to help explain the initial settlement of the Santa Clara Valley area is linguistic and archeological in nature. Linguistic evidence suggests that the ancestors of the Ohlones moved into the San Francisco and Monterey Bay areas around A.D. 500 (Levy 1978:486). Heizer presents an alternative summary of the prehistoric occupation of Ohlone territory. "The major shoreline occupation of the

Central California coast seems to have occurred from 3000 to 3500 years ago, although traces of earlier settlements almost certainly remain to be discovered" (Heizer 1971:140; Mayfield 1978:72). Archaeologically, movement into the San Francisco Bay Area coincides with evidence from shellmounds from the same time period. Although there are few sites located in the Santa Clara Valley, many show signs of habitation dating to roughly 4,000-10,000 B.P. (Breschini, et al. 1983:306; Mayfield 1978:72). We must again recognize that there are very few early archeological sites located in the Santa Clara Valley, probably due to the rising sea levels that covered most of the earliest sites with water (Breschini, et al. 1983:306; Mayfield 1978:72).

The first contact the Spanish had with the Ohlone was in 1602 (Pavlik, et al. 1991:103; Levy 1978:486). The Spanish explorer Sebastián Vizcaino arrived in Monterey and recorded the encounters with the Ohlone (Levy 1978:486). It was not until 1769 and the founding of Monterey, that the Spanish again made contact with the Ohlone. Under the direction of Gaspar de Portolà, an expedition of the known Ohlone territory was performed from 1769-1776, to provide important information on settlement pattern, population, subsistence and material culture (Levy 1978:486; Mayfield 1978:9). At the same time several other explorers were beginning detailed expeditions from San Francisco south to Monterey.

## **OHLONE TERRITORY**

The Ohlone people cover a large geographically distinct territory (Levy 1978:487). The speakers of its member languages lived in the upper reaches of the San Francisco Bay Area south down to the Salinas Valley and Monterey Bay. Kroeber described the Ohlone territory as the following:

At the point where these two streams [the San Joaquin and the Sacramento Rivers] debouch into San Francisco Bay Costanoan [Ohlone] territory begins...the entire southern border, including the long arm known as San Francisco Bay proper, was Costanoan [Ohlone] to the Golden Gate. From here south their range followed the coast to beyond Monterey: to Point Sur to be exact.

The Costanoan [Ohlone] limits inland are not precisely known. They have sometimes been asserted, or loosely assumed, to have been formed by the San Joaquin River, but it is far more probable that the boundary was constituted by the interior chain of the coast ranges, the Mount Diablo Range of the maps.



The included territory falls into two natural divisions. The northern half drains into the San Francisco Bay, or by short streams into the adjacent ocean. The southern half included the catchment area of the Pajaro River and the lower courses of the Salinas and Carmel, all of which flow into Monterey Bay or the ocean just below. The mainline of dialectical cleavage within the Costanoan [Ohlone] group appears to coincide with the irregular line separating these northern and southern areas.  
(Kroeber 1925:462).

Geographically, Ohlone territory was characterized by broad oak-lined valleys and an abundance of marine resources (Breschini, et al. 1983:287). For instance, the Santa Clara Valley provided an inland environment which was rich in oak trees, prairie grasslands and chaparral. The coastal areas were also characterized by an abundance of oaks as well as marine resources (Breschini, et al. 1983:287). Portions of Santa Clara Valley floor and parts of the coast consisted of fresh water marshes and contained riparian forests, grasslands, and scrub vegetation communities (see Blume 1994, Reilly 1994; this series). The South Coast Range was characterized by redwood forests and various vegetation communities. With some exceptions, these geographic and vegetation areas constituted the primary location of Ohlone territory.

There are several descriptions of the plant cover, vegetation communities and the massive Oak Woodlands which can be found in the journals, books and recorded quotations of the early explorers. These descriptions are often specific for varied locations, using major geographic features, such as rivers and mountain ranges, as points of reference. For instance, on April 2, 1772 Crespi wrote about the area around Scott Creek in the heart of what is today Santa Clara.

We did not stop at the arroyo of Encarnacion because of the lack of firewood, but went on about another league to another great arroyo with good water, which has a great deal of firewood from oaks and live oaks.  
(Bolten 1927:301; Mayfield 1978:126).

The explorer Vancouver described the area just west of Santa Clara in 1792: "Our road back was over a more elevated country to that of the morass, leading through a continuation of the forests of oaks" (Mayfield 1978:129; Vancouver 1798, Vol. 2:25).



In the 1770's Juan Bautista de Anza, another explorer of the Santa Clara Valley area, noted the abundance of oaks in the area: "...we entered a spacious plain with many oaks and live oaks" (Bolton 1927). In the same year, Father Font made a similar observation about the west side of the Santa Clara Valley:

This place is in the Llano de los Robles [Plain of the Oaks], which began a little after we set out from camp, and through which we traveled all the way. In this valley or plain there is a great abundance of oaks, in some places more, and in others less...(Bolton 1927:323; Mayfield, 1978:132).

These first hand accounts confirm that there was in fact many oak trees in the Santa Clara Valley that could be utilized as food and non-food resources, and which formed the basis for a delicate ecological microsystem.

## POPULATION

When examining Ohlone subsistence requirements, it is important to know the population of Ohlone people that depended upon the natural resources of the Santa Clara Valley. There are several estimates as to the number of Ohlone prior to contact with the Spanish, with some estimates running as high as 10,000, while more conservative estimates place the total population at approximately 7,000 (Breschini, et al. 1983:287). Using data from several different studies and comparing that to the potential carrying capacity of the environment, it would not be extreme to suggest an Ohlone population that neared 10,000 (Breschini, et al. 1983:287).

The Ohlone communities that inhabited the Santa Clara Valley are less well documented, and, therefore the exact population must be estimated. The best evidence for population comes from Mission sources. According to their records, there were five village groupings which occupied the Santa Clara Valley area. These included the San Bernardino (occupied the San Francisquito Creek watershed), the Saucon (occupied the southern drainage of the Bay), the Quemelantos (were south of the Saucon), San Jose Cupertino (occupied the Stevens Creek area), and the Matalan (lived in the south end of the valley) (Mayfield 1978:144). Mayfield suggests that some groups such as the San Jose Cupertino had as many as 1,000 members, while the second largest grouping, the Matalan, had as many as 500 inhabitants (Mayfield 1978:144). This would suggest a maximum population of approximately 3000 in the Santa Clara Valley alone. If this number is correct, it might suggest that our current estimation for the entire culture area is too low, and thus warrants renewed study.

Although the differences in language and politics among the independent village groups may have limited relations and trade (Levy 1978:488), recent

archeological evidence suggests that trade was widespread. It is known in the early historic period that the Ohlone had reciprocal trade with the Yokuts of the Central Valley, but little is known about the exact nature of those or other trade relationships prior to Spanish contact (Bergthold, et al. 1980:9).

## **FOOD RESOURCES**

The mosaic environment of the coast and inland areas provided an excellent resource base for the Ohlone of Santa Clara Valley. In many cases, nutritional demands were met by relying on an abundance of a few resources that were located in a general area. Kroeber noted that "...the food resources of California were bountiful in their variety rather than in their overwhelming abundance...If one supply failed, there were a hundred others to fall back upon" (Kroeber 1925:524). Therefore, the absence of some resources during certain seasons sometimes resulted in travelling short distances to acquire other food materials. The Ohlone used reserve village sites away from their main settlements when gathering seasonal foods. "These villages were occupied seasonally, and people frequently traveled from [reserve]village locations to obtain food resources, and then traveled back to the [main]villages" (King 1974:78). In times of poor acorn crops due to drought or bad weather, traveling to obtain other food sources such as stored acorns, deer, salmon or mollusks was required. It is even suggested that tribes would rely upon the stored acorns or meats of the tribes in times of serious trouble. This would have been necessary only in times of extreme natural disasters because of the extensive marsh distribution along the various sloughs and lakes coupled with the riverain associations, grasslands, and oak distribution complemented the coastal shell resources to establish a food resource base greater than average for the coastal ranges south of San Francisco Bay" (Edwards and Farley 1974:5). For example, the archaeological excavation of one site in the southern San Francisco Bay produced this summary of dietary traits: "Location, dietary remains, and artifacts indicate a generalized economy of acorn and shellfish collecting, fishing with nets and gorge fishhooks, and some hunting of birds and land mammals" (Gerow and Force 1968:124).

## **NON-FOOD RESOURCES**

Fulfilling the demands for both shelter and transportation required the Ohlone to have a specific knowledge of their diverse environment. Protection from cool temperatures in the winter and extreme heat in the summer, led the Ohlone to utilize resources from the forests as well as furs from ocean mammals. Tule reed huts and canoes were crafted for shelter and transportation. Although there are no references to earth covered lodges or lodges constructed of redwood or cedar as in the Northwest, historical documents mention conical shaped houses composed of tule reeds with thatched roofs (Levy 1978:492; Margolin 1978:54). Held together by



slender poles and a small frame, the thatched homes were covered with matted grass or tule reeds (Levy 1978:492). The Ohlone also used sweat houses which were usually twice as large as normal huts and were dug into the earth and located along stream banks near the village (Levy 1978:492; Margolin 1978:15-16). Sweat houses were used in purification ceremonies prior to hunting or spiritual ceremonies (Margolin 1978:16). Tule reed canoes provided excellent transportation for the Ohlone, giving them the ability of ocean travel, while being light enough to carry over land (Mayfield 1983:75).

## ANIMAL RESOURCES

The use of smaller trees and grasses from the grassland communities as well as large and small animals, provided materials for the construction of shelter, transportation and food materials, respectively (Levy 1978:491-92). From this resource base rocks and other tool materials were widely used in the processing of food materials, such as acorns, as well as other non-food resources (Levy 1978:493).

The Ohlone relied upon several species of land animals found in the rich forests and grasslands along the coast and interior to supplement their dietary staple. The list of animals hunted include larger animals such as bear and deer, as well as smaller animals such as snakes, squirrels, lizards and rats (Levy 1978:491). Other large game included, elk, antelope, and Mountain Sheep, which were plentiful and widely hunted in the Grasslands and Oak Woodlands of the Santa Clara Valley (Margolin 1978:24). These animals were hunted in several ways based upon location and the species being hunted (Margolin 1978:24). Deer and other large animals were hunted with the use of a snare or bow and arrow (Levy 1978:492). The deer would be driven down a trail where a snare had been placed or where men were waiting with bow and arrows or a spear (Margolin 1978:25).

The Grizzly Bear, who shared the same diet as the Ohlone--acorns, roots, berries, elk, deer and fish -- was often times avoided because of its ferocity and the danger it posed to the hunter (Pavlik 1991:91). However, there is evidence to support the assertion that smaller bears, such as the black bear were hunted.

Game such as rats, squirrels and rabbits were hunted or snared on a regular basis (Levy 1978:491; Margolin 1978:24). Although these were not a vital supplement to Ohlone diet, they did provide additional foods in time of scarcity.

## PLANT RESOURCES - ACORN USE

For generations the Ohlone, utilized acorns as a dietary staple (Breschini, et al. 1983:291; Levy 1978:491; Margolin 1978:41). The high nutritional value of the acorn, combined with its abundance and storage ability, gave the Ohlone a consistent and reliable food staple (Basgall 1987:25; Heizer and Elsasser 1980:95-97; Pavlik, et al. 1991:75).<sup>2\*</sup> When Ohlones did compete with other animals for acorns, the variety and abundance of oak trees and species made harvests consistently plentiful. Of the five species of oak trees readily available through direct gathering or trade in the Santa Clara Valley and surrounding area, the Ohlone traditionally preferred those that were local, produced a plentiful acorn crop, and tasted better. With these three characteristics in mind, the Ohlone primarily used three species of oak tree during harvesting time: the live oak, valley oak and the black oak (Levy 1978:491; Margolin 1978:41). Although it produced the smallest acorn of the three, the Ohlone used the acorns of the black oak, when available, because of its sweet taste, while the live oak and valley oak were used more readily (Margolin 1978:19,41).

## ACORN HARVESTING

In the late summer and early fall most Ohlone participated in the gathering of the acorn crop (Margolin 1978:41). Harvesting of the black oak, live oak and valley oak was done by small families that included close relatives. In mid to late fall, families would leave the main camp and go to their own oak grove to gather acorns. Over the next month to month and a half, all members of the family would be involved in the harvesting and preparation of acorns for storage (Breschini, et al. 1983:96; Margolin 1978:42).

The gathering of acorns was a time of both work and celebration for the Ohlone (Margolin 1978:41). Men and boys would climb the trees to shake down the acorns, while women and girls would gather them from the ground (Levy 1978:491). The acorns chosen had to be free from insects and worms, otherwise they would not be gathered. Basgall noted that in one-day's time, a family with four members could gather the acorns of one large tree or two small ones, amounting to nearly 25 kg, or approximately 13 pounds of acorns (Basgall 1987:25-26). Once their baskets were full, women would transport the acorns back to camp. The burden basket, which was primarily used for carrying materials, was vital to the transportation of acorns from the grove back to the temporary camp and eventually to the final storage place (Basgall 1987:27; Elsasser 1978:634; Levy 1978:493; Margolin 1978:42). Family members continued to work in order to harvest as many acorns as might be needed

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<sup>2\*</sup> [For a detailed listing of the nutritional values of the different species of acorn see Appendix I (Basgall 1987:25; Heizer and Elsasser 1980:96).]



for the coming winter as well as extra for storage, to be used later in a time of need or natural disaster (Margolin 1978:42; Pavlik, et al. 1991:98).

## **STORAGE**

After harvesting of the acorns was completed, families would return to the main camp to prepare the acorns for storage. Storage was a vital part of harvesting because it ensured the availability of food during the winter when food was scarce and weather prohibited gathering or hunting activity (Basgall 1987:25).

The ability to store the acorn for extended periods of time was very essential to the Ohlone. During storage, the Ohlone needed to ensure that the acorns, still within their shells, were safe from the insects or animals which would eat them, and the moisture, that would rot the entire crop (Margolin 1978:43). There are several types of recorded storage techniques that the Ohlone used to ward off pests and prevent rotting (Margolin 1978:43).

The most widely used technique for storing acorns was the use of granaries (Heizer and Elsasser 1980:94). Items such as storage baskets and large granaries had to be constructed and prepared to store acorns. The construction of these storage containers demanded the development of specific jobs, or cultural adaptations, which relate directly to the use of the acorn. Granaries, which were as large as 14 feet high, were usually round or conical caches that were placed approximately three to four feet off the ground to avoid rodents (Pavlik, et al. 1991:98). To prepare the acorns for storage, they were first dried over a low fire (Pavlik, et al. 1991:98). They were then placed out in the sun for several days allowing them to fully dry out. Once dry, granaries were built from either reeds or tree branches and prepared for storage. Preparation of the granaries involved several steps. First the granaries were lined with leaves to help protect against moisture and rodents (Margolin 1978:43). The next step was to then place the acorns in the granary. Once inside, the acorns were covered with cedar bark and twigs, which were used as an insect repellent. Protected from moisture, rodents and insects, the granary was then sealed to protect the acorns from larger animals such as deer, raccoons, squirrels and bears. The granary was then mounted into its position where it would stay for up to two years or until needed next (Basgall 1987:25).

## **PROCESSING**

While acorns were often cooked and eaten in several different forms such as mush, soup or bread, it was rarely eaten raw due to its bitter taste from the many tannins, or toxins, that were present in the acorn (Levy 1978:491; Margolin 1978:118; Pavlik, et al. 1991:99-100). As did other Native Californians, the Ohlone

approximately six pounds of acorn meal in under 8 hours (Basgall 1987:28). This whole process would be completed over a three day period, so that a two day supply of acorn meal was always leached and ready to cook if there was ever a crisis or one was unable to prepare any new meal (Basgall 1987:28).

## **NON-FOOD USES**

Oak trees, in addition to their dietary uses, were also used to make non-food materials such as medicine, tanning agents and dyes (Pavlik, et al. 1991:101). Although there is no direct evidence for Ohlone use of oaks as a medicine, a bordering tribe, the Salinans, were reported to have used a brew from the valley oak to treat bladder infections (Pavlik, et al. 1991:101). Watery infusions from the insect galls on the oak trees were preferred for the washing of open wounds (Pavlik, et al. 1991:101). A fungi that grows on acorn meal was also used as a remedy for boils or open sores (Pavlik, et al. 1991:101). Perhaps this fungi was used as an antibiotic, just as we use penicillin today.

Tannins obtained from the bark of such trees as the valley oak, interior live oak and black oak were used by the Ohlone for making dyes and decorating animal skins (Pavlik, et al. 1991:101). The bark from a tree would be boiled then mixed with iron oxide from soil until the pigment turned jet black (Pavlik, et al. 1991:101). Deer, elk and other hides were also treated with tannins from the bark of the oak to soften and color the skins. Dyes, aside from their uses on animal skins, were also used for face painting and decoration during religious ceremonies as well as for tattooing (Levy 1978:494; Pavlik, et al. 1991:101).

## **CULTURAL ADAPTATIONS**

As we have seen, the environment of the native Ohlone was a varied one, supplying a bounty of resources for the Ohlone. The Ohlone had to examine their surroundings and culturally adapt their knowledge so that they might fulfill their subsistence needs. Yet the patterns of Ohlone culture were highly interconnected with aspects of the environment.

The very important knowledge of seasonal change, marked by the growth and development of the oak tree, was essential to the Ohlone in developing a concept of seasonality and a sense of time. Seasonality, or the rotation of food resources based upon the changing of the seasons, aided the Ohlone by giving them the ability to recognize the presence of other food resources besides that of the acorn. For example, the Ohlone also depended upon animals for food and the skins, and, therefore, needed an intimate knowledge of animal behavior. The Ohlone knew, for example, that "enormous bears where everywhere...congregating beneath oak trees



during the acorn season..." (Margolin 1978:7). As stated earlier, the Ohlone knew that during certain seasons animals would be drawn to oak community food resources.

The Ohlone used the stages of development of the oak tree acorn crop, for instance associating it directly with the changing seasons, just as if the developmental stages of the oak tree represented a calendar. In the spring, the Ohlone would celebrate the bud-thickening as well as the appearance of tiny cascades of pale oak flowers (Margolin 1978:41). They would mark the coming of summer as so many moons until harvesting time in the fall. In fall, the acorn harvest would begin (Margolin 1978:42). The beginning of the harvest marked the beginning of the New Year for the Ohlone; a time of joy and celebration, and a time of dancing in the oak groves to encourage a good harvest (Margolin 1978:42).

Another significant cultural adaptation was the development of their basketry. The use of baskets played an extremely important role in the development of the acorn storage process. The burden-basket allowed the Ohlone to harvest and transport acorns much more efficiently and in greater numbers. At the same time, the development of bigger, stronger baskets allowed the Ohlone to explore new storage methods and thus improve their storage technology. It is not unreasonable to assume that Ohlone movement toward adapting the acorn as a dietary staple lead to and facilitated the development of new basketry production techniques. This movement to develop better basketry technology would, in return, facilitate the experimental use of new methods and resources for basket making. The sophisticated use of baskets within the cooking process is a good example of this elaboration.

Another important cultural adaptation we find among the Ohlone peoples is the use of the pestle and mortar. This adaptation is as uniquely important as the development of basketry. In order to make this adaptation, there are several factors which the Ohlone must have considered. A thorough understanding of geology and rocks must have been present for the processing as well as the cooking of the acorn. For instance, the Ohlone must have had knowledge of which rocks were best suited to be heated and then used for cooking, and which rocks would not break under the constant strain of grinding and preparing acorn meal.

Many of the cultural adaptations noted so far have been directly connected with the use of the oak tree and acorn as a food resource. The significance of these adaptations is great, yet we do not see the full development of these adaptations without touching upon the spiritual beliefs of the Ohlone. In their oral traditions, an Ohlone creation myth describes the origins of their people in association with the use of the acorn as their most important food source. The story begins with Coyote making a women pregnant and creating a new race of people.

Now Coyote gave the people the carrying net. He gave them bows and arrows to kill rabbits. He said: 'You will have acorn mush for your food. You will gather acorns and you will have acorn bread to eat. Go down to the ocean and gather seaweed that you may eat it with your acorn mush and acorn bread. Gather it when the tide is low, and kill rabbits, and at low tide pick abalones and mussels to eat. When you can find nothing else gather buckeyes [nuts] for food. If the acorns are bitter, wash them out: and gather grass seed for pinole, carrying them on your back in a basket. Look for these things of which I have told you. I have shown you how to gather food, and even though it rains a long time, people will not die of hunger. Now I am getting old. I cannot walk. Alas for me! Now I go (Margolin 1978:136-137).

From this passage, we see the true importance of the acorn in Ohlone culture. Not only did the Ohlone adapt ways to utilize the acorn as a food resource, but they actually adapted the oak tree and made it an essential part of their cultural heritage.



## CHAPTER 4

### THE DISAPPEARANCE OF THE OAK WOODLAND

#### INTRODUCTION

Although many of the oak groves that were present in the Santa Clara Valley 200 years ago are now gone, the importance of the oak tree still remains today. In addition to providing a valuable source of food for many animals in the valley in the form of acorns, the oak tree still remains an important non-food resource for many people. When looking at the decimation of the Llano de los Robles, or plain of the oaks, it is important to understand where and how these important resources left the Santa Clara Valley (Pavlik, et al. 1991:104).

#### SPANISH USE

Since the arrival of the Spanish missionaries, the distribution and size of wildlife populations in the Santa Clara Valley have been reduced dramatically (Mayfield 1978:58). This reduction began with the slow changes in the use of the oak tree. Instead of remaining a respected, consistent and abundant food resource, the Spanish began the slow deforestation of the oak groves in the Santa Clara Valley. The Spanish did not rely on the oak tree for subsistence (Pavlik, et al. 1991:104). This removed the Spanish from the indigenous habitat and ecological relationship to the environment and resulted in the destruction of the primary resource of the Ohlone and, in effect, their culture.

#### AGRICULTURAL USE

The central reasons for deforestation was agricultural (Mayfield 1978:58; see also Czosek 1994; this series). The arrival of the Spanish brought the need to plant crops such as wheat, barley, lima beans, beans, corn, and peas (LoCoCo 1777:34, see Czosek 1994; this series). In order to clear fields, the Spanish deforested any oaks that were in the way, thus disturbing the delicate ecosystem characteristic of Oak Woodland communities. Typically, the Spanish would place their agricultural fields next to water sources, such as rivers or streams, which were usually occupied by oak

trees or oak shrubs (LoCoCo 1777:32,34). This resulted in the felling of all oak trees in the way of any potential agricultural fields.

The Spanish also saw the massive oak tree as a great source of lumber. In 1826 while traveling through the San Joaquin River area, Jedediah Smith recorded this passage in his journal: "In this vicinity the plains are generally clothed with grass and were at that time covered with Blossoms. Along the river there is some timber [oaks]" (Brooks 1977:144). He goes on to say "...my course having been over the spurs of the Mt[sic] the timber Oak and rather scrubby [sic] plenty of grass and water a fine grazing country" (Brooks 1977:151). As his passage demonstrates the Spanish also used the grasslands of the oak community for grazing. The combination of agricultural needs, the felling of oaks for fire wood and the building of items such as tables, chairs and doors, and the use of grasslands for grazing, resulted in the destruction of the delicately balanced, inter-dependant oak woodlands.

When the Spanish first arrived, the Grassland habitat, and the Oak Woodland was greatly affected by the introduction of new species of plants and animals (see Blume 1994; this series). Horses, sheep and cattle competed with elk, antelope and deer for grazing land (LoCoCo 1777:13; Mayfield 1978:58). In times of drought or harsh weather, wild horses and other animals had to be slaughtered to save pasture land for domesticated grazing animals (Mayfield 1978:58). The arrival of cattle and sheep from San Diego further complicated the grazing problem (LoCoCo 1777:33). By 1777, at Mission Santa Clara, there were over 1,000 head of domesticated grazing animals that included approximately 150 sheep, 150 goats, pigs, cattle, mules and horses (LoCoCo 1777:33).

Although agriculture, grazing and the felling of oaks had devastating effects for the Ohlone, the Ohlone still were capable of harvesting an ample supply of acorns during the first years of Spanish occupation (LoCoCo 1777:21-39). Over time this no longer was possible due to one reason, the Spanish conversion of the Ohlone to Catholicism. By the time the Ohlone had discovered what the Spanish were doing to their oak groves, it was too late. The Spanish, over the course of only 40-50 years, destroyed many of the native oak groves in the Santa Clara Valley region, leaving the Ohlone with no means of independent subsistence (Pavlik 1991:104). The new Ohlone converts, or neophytes as the priests called them, had been moved to live in Mission Santa Clara de Asis. Over time, however, the neophytes were forced to become dependant upon the agricultural resources of the mission. With the massive oak groves now gone, the Ohlone people had no where else to turn, except to the missions that provided food. There only hope for survival was to stay in the mission and rely on the Spanish for survival.

By destroying the environment, the Spanish were also disrupting the Ohlone culture. As we have seen, the distribution and variety of animal communities were adapted to specific plant communities where they obtained food and shelter. When



their environment was destroyed, the Ohlone way of life ceased to exist as they had known it. They slowly moved into the missions where their practice of their culture was discouraged and punished if practiced. Thus, the Spanish were able to effectively convert, or conquer, the native Ohlone by controlling their culture through the destruction of the environment.

## CHAPTER 5

### CONCLUSIONS

#### SUMMARY

We began with a general overview of the surrounding environment and natural physiographic, geologic and climatic conditions. On the basis of both primary and secondary sources, we have examined the prehistoric economy of the native Ohlone of Santa Clara Valley and found it to be a highly developed economy, based primarily on acorn consumption. Developed from the surrounding climate, geology and physiography, the varied plant and animal communities formed a delicate inter-dependant system. From an ecological viewpoint, we were able to see that these conditions regulated the types and abundance of all plant and animal communities.

Vegetation communities such as the Grassland, Chaparral and Oak Woodland thrived and dominated the Santa Clara Valley. Within combinations of these communities, great oaks such as the Valley Oak, Interior Live Oak, Blue Oak, Black Oak and Coast Live Oak flourished providing animals with resource areas. The intricate balance that developed between plant and animals communities in the Santa Clara Valley was understood and taken advantage of by the native Ohlone.

Although the Ohlone were tied to their environment, as were the very resources they depended on, their ability to obtain and manipulate those resources was substantive. Through close examination of the harvesting, gathering and storage techniques of their dietary staple, the acorn, we were able to see the unique cultural adaptations made by the Ohlone.

When we delve deeper into the Ohlone lifeways, we find that not only were these cultural adaptations a part of everyday life, they also formed a foundation from which the Ohlone formed a sense of spiritual or religious awareness. For example, the Ohlone creation myth is founded solely on the use of the acorn as the dietary staple. The incorporation of a myth based on the use of the acorn shows how deeply the adaptations to this resource were embedded into Ohlone culture. It is this respect for the environment on which they relied that allowed the Ohlone to survive and grow as a culture for hundreds of years.

With the arrival of the Spanish explorers in the late 1700's came a new way of life and new culture for the native Ohlone. They were moved into the missions,



denied their traditional foods and culture, forced to live the way of "civilized" man. The Spanish, over time, cleared the "Llano de los Robles", plain of the oaks, for firewood, building materials and grazing, leaving the Ohlone with very few natural resources from which to survive (Pavlik, et al. 1991:104). Turning to the missions for subsistence, Ohlone people gradually lost their culture in the repetitive discipline of Catholicism, never to be fully recaptured again.

## Appendix A

### **Nutritional Analysis of Acorns, Wheat and Barley** (content cited as percentage)

Source	Water	Protein	Fats	Fiber	Carbohydrates
Coast Live Oak	29.10	4.88	13.05	9.04	42.52
Blue Oak	33.60	4.00	5.90	7.15	47.80
Black Oak	31.40	3.44	13.55	8.60	41.81
Valley Oak	40.80	3.19	3.60	6.15	44.91
Wheat	11.5	11.4	1.0	0.2	75.4
Barley	10.10	8.70	1.90	5.70	71.00

SOURCES: Basgall 1987:25; Heizer and Elsasser 1980:96



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